

A scenic landscape photograph of a green field with a large tree and mountains in the background. The text is overlaid on the image.

# Source Protection and Land Use Planning: Overview and Mapping Tools

Liz Royer, Vermont Rural Water Association  
The Future of Vermont's Drinking Water  
June 2017

# Vermont Rural Water Association (VRWA)

- Non-profit trade association
- Provides training and technical assistance to public water and wastewater systems
- National Rural Water receives funding that is transferred to 49 state associations
- Source water positions funded by USDA





# Vermont Source Protection Program

- Administered by the Vermont DEC - Drinking Water and Groundwater Protection Division
- Source protection plans (SPPs) required since 1992 for all community and non-transient (NTNC) systems
- SPPs must be updated every three years
- One of the few states that requires plans



# **Source Protection in Vermont**

- **232 square miles of Groundwater (Wellhead) Source Protection Areas**
- **286 square miles of Surface Water Source Protection Areas**

**~6% of the land area in Vermont is  
part of a Source Protection Area**





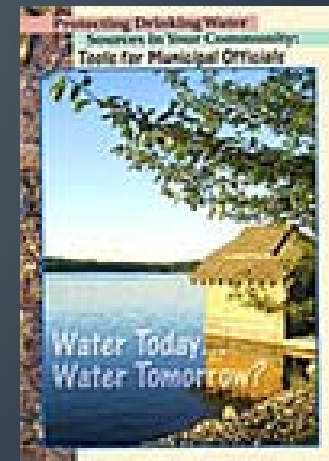
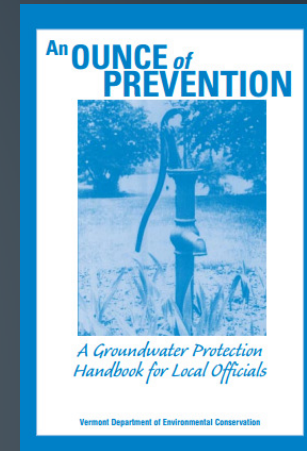
# Source Protection Challenges

## Municipal involvement in drinking water source protection is imperative

- State regulations provide minimal protection
- Landowner and agency notification are required but land use activities cannot be restricted based on the source protection plan

# Guides for Local Officials & Planners

- Ounce of Prevention: Vermont Groundwater Handbook for Local Officials
- Protecting Drinking Water Sources in Your Community: A Source Water Protection Tool for Municipal Officials





# GROUNDWATER AND DRINKING WATER RESOURCES FOR VERMONT PLANNERS

GROUNDWATER AND DRINKING WATER RESOURCES FOR VERMONT PLANNERS – 6/5/2017 DRAFT	
QUESTION	ONLINE RESOURCE
What groundwater resources and maps are available for our town? How can I find out if we have arsenic, uranium, or other naturally occurring contaminants?	<a href="http://dec.vermont.gov/geological-survey/groundwater/town-gw">http://dec.vermont.gov/geological-survey/groundwater/town-gw</a> Local Groundwater Resource Studies – Vermont Geological Survey <a href="http://dec.vermont.gov/geological-survey/geology-and-health">http://dec.vermont.gov/geological-survey/geology-and-health</a> Geology and Health - Vermont Geological Survey <a href="http://www.healthvermont.gov/tracking">http://www.healthvermont.gov/tracking</a> - Health Department Tracking Data
Is our groundwater use proposed to increase in the future? If so, in which part(s) of town?	<a href="https://pubs.usgs.gov/sir/2010/5053/">https://pubs.usgs.gov/sir/2010/5053/</a> - USGS Study - Estimated Water Withdrawals and Return Flows in Vermont in 2005 and 2020 <a href="http://anrmaps.vermont.gov/websites/anra5/">http://anrmaps.vermont.gov/websites/anra5/</a> Click on Drinking Water and Groundwater; layer is called "Groundwater Withdrawals – Projected 2020" and data is displayed by census block
How can groundwater resource maps be used in the planning process?	<a href="http://www.mnrgs.umn.edu/user_guide_v1.pdf">http://www.mnrgs.umn.edu/user_guide_v1.pdf</a> - Geologic Atlas User's Guide: Using Geologic Maps and Databases for Resource Management and Planning
Are there any public water systems in my town?	<a href="https://anrnode.anr.state.vt.us/DWW/">https://anrnode.anr.state.vt.us/DWW/</a> Vermont Drinking Water Watch (searchable by county or system name) <a href="http://anrmaps.vermont.gov/websites/anra5/">http://anrmaps.vermont.gov/websites/anra5/</a> Click on Drinking Water and Groundwater: Layer is called "Public Water Sources"
Are there any source protection areas in my town?	<a href="http://anrmaps.vermont.gov/websites/anra5/">http://anrmaps.vermont.gov/websites/anra5/</a> Click on Drinking Water and Groundwater: Layers are called "Surface Water SPA" and "Groundwater SPA" (these terms replace the older "Aquifer Protection Area" and "Wellhead Area")
Is there anything more we can do protect the groundwater in our town?	<a href="http://dec.vermont.gov/water/groundwater-reclassification">http://dec.vermont.gov/water/groundwater-reclassification</a> Petition for Vermont's Class II Groundwater Designation <a href="https://www3.epa.gov/region1/eco/drinkwater/pc_solesource_aquifer.html">https://www3.epa.gov/region1/eco/drinkwater/pc_solesource_aquifer.html</a> Petition for Sole Source Aquifer status from US EPA Region 1
Is there a factsheet or more information for groundwater reclassification?	<a href="http://dec.vermont.gov/sites/dec/files/dwgwp/gwreclass/pdf/classiandiiprocedure2008.pdf">http://dec.vermont.gov/sites/dec/files/dwgwp/gwreclass/pdf/classiandiiprocedure2008.pdf</a> Class II Groundwater (uniformly excellent character) <a href="http://dec.vermont.gov/sites/dec/files/dwgwp/gwreclass/pdf/gwreclassivfactsheet.pdf">http://dec.vermont.gov/sites/dec/files/dwgwp/gwreclass/pdf/gwreclassivfactsheet.pdf</a> Class IV Groundwater (non potable)
What should we be thinking about if we might want to develop a small water system for our village in 5 years? 20 years?	<a href="http://accd.vermont.gov/community-development/funding-incentives/municipal-planning-grant">http://accd.vermont.gov/community-development/funding-incentives/municipal-planning-grant</a> - Vermont ACCD Municipal Planning Grants <a href="http://dec.vermont.gov/grant-loan-programs">http://dec.vermont.gov/grant-loan-programs</a> - Vermont DEC Grant and Loan Programs
What do we do if water sources (private wells, village springs, etc.) in our town run dry?	<a href="http://dec.vermont.gov/facilities-engineering/water-financing/on-site-loan">http://dec.vermont.gov/facilities-engineering/water-financing/on-site-loan</a> - On Site Loan <a href="http://dec.vermont.gov/grant-loan-programs">http://dec.vermont.gov/grant-loan-programs</a> - Vermont DEC Grant and Loan Programs

# Vermont Source Protection Program

Total of **593** active public water systems\* required to have a source protection plan

	Groundwater	Surface Water
Public Community Water Systems	315	37
Non-Transient, Non-Community Systems	239	2
<b>Total</b>	<b>554</b>	<b>39</b>

\* Many systems have more than one source and may have multiple source protection areas – data as of 6/1/2017



# Challenges in Source Water Planning

- Source protection areas and water customers may be in different municipalities
- Systems not governed by municipal boards (mobile home parks, condominiums, nursing homes)
- Fire Districts may not connect with town officials
- Requirement to plan but not implement



Summary of 2016 Town Plan and Zoning Review by UVM/ANR Summer Intern		Percent of Towns & Cities Reviewed
Vermont Towns and Cities Included in Review	249	
Number with Approved Municipal Plans	236	95%
Mention of Groundwater, Water Supply, or Potable Water	236	95%
Number with Zoning Bylaws	189	76%
Mentions of Source, Wellhead or Aquifer Protection in Zoning	59	24%



## Zoning District, Overlay or Ordinance

Wellhead Protection Overlay District	13
Aquifer Protection Areas/Overlay District	9
Watershed (Protection) District	4
Public Water/Source Protection Areas	4
Source Protection Overlay District	6
Reservoir Protection Overlay District	2
Aquifer Recharge District/Protection Area	2
Also: Water Supply Source Protection Ordinance, Groundwater Source Protection Area District and Water Supply Protection District	

**17% of Vermont towns have municipal protection**

Note: several towns are now including source protection areas in general development standards

Note: this only includes ordinances if they are referenced in the Town Plan or Zoning (known exclusions)

<https://anrnode.anr.state.vt.us/DWW/>



### Public Water Supply Systems Search Parameters

Water System No.	<input type="text"/>
Water System Name	<input type="text" value="wheelock"/>
Principal County Served	<input type="text" value="All"/>
Water System Type	<input type="text" value="All"/>
Primary Source Water Type	<input type="text" value="All"/>
Point of Contact Type	<input type="text" value="None"/>

### Sample Search Parameters

Sample Class	<input type="text" value="Click to select a value..."/>	
Sample Collection Date Range	<input type="text" value="6/5/2015"/>  To <input type="text" value="6/5/2017"/> 	
<small>(The Sample Search always produces results for the last 2 years, unless you provide a specific date range.)</small>		

[Search For Water Systems](#) [Search For Samples](#) [Review Consumer Confidence Data](#) [Clear](#) [Glossary](#)





# Natural Resources Atlas

Vermont Agency of Natural Resources

## Map Layers

Layer Theme: Atlas Layers (default)

### ☒ Atlas Layers

☒ Waste Management

☒ Fish and Wildlife

☒ Watershed Protection

☒ Geology

☒ Drinking Water and...

☒ Forests Parks and Recreation

### ☒ ANR Basemap Data

☐ Buildings (E911)

☐ Act250 Permits \*\*INCOMPLETE\*\*

☒ Bridge & Culvert Inventory

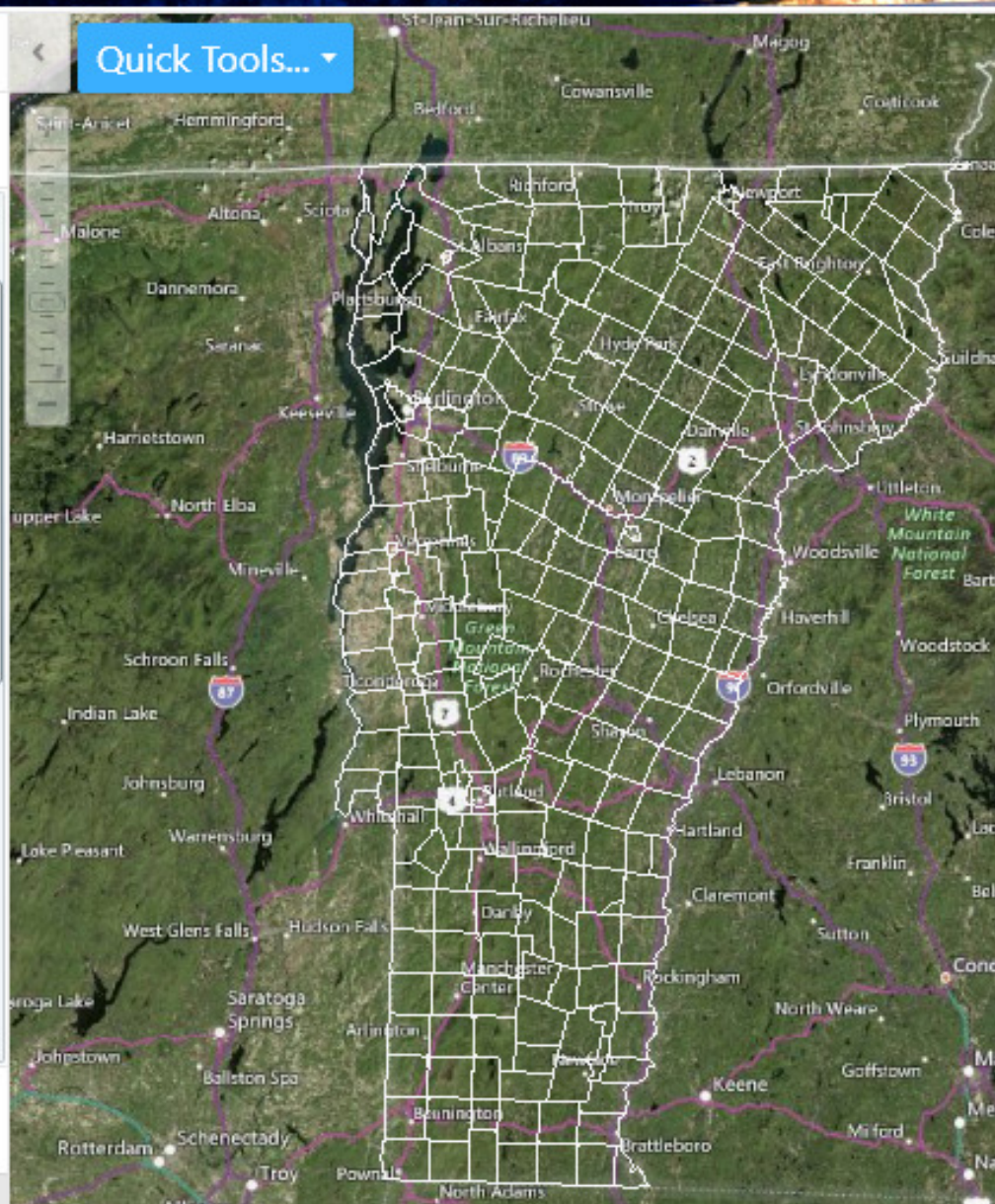
☐ Railroads

☐ Roads

Show Legend








Filter...

## Quick Tools...











☒ Drinking Water and Groundwater

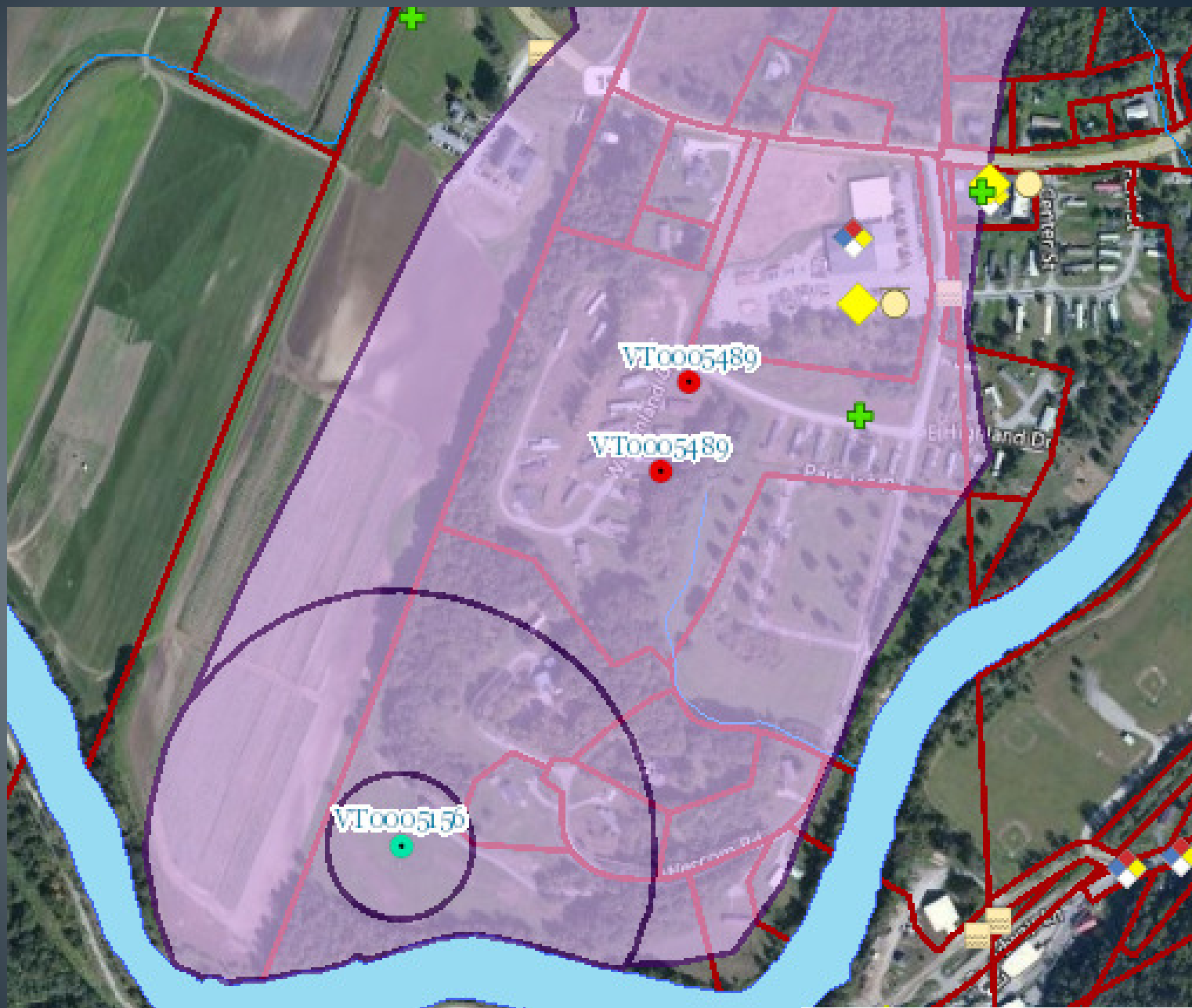
Protection

- ☐  Waste Water Facilities
- ☐  Sewer Service Area
- ☐  Private Wells
- ☒  Public Water Sources
- ☐  Groundwater Interference
- ☐  Surface Water SPA
- ☒  Ground Water SPA
- ☐  Groundwater Classification

☒ Waste Management

- ☐  Landfills
- ☐  Land Use Restrictions
- ☐  Hazardous Site
- ☐  Hazardous Waste Generators
- ☐  Brownfields
- ☐  Salvage Yard
- ☐  Underground Storage Tank  
(working)
- ☐  Dry Cleaner









# Private Water Supplies Bedrock Wells

- 92,314 bedrock wells in Vermont
- Statewide means of 293 feet deep and 13.76 gallons per minute
- Also many dug wells and springs (not part of state database)



# Private Well Layer in Atlas

- **Location reliable for ~16% of 100,000 records (based on E911 address or GPS measurement)**
- **5% of the wells have been tested (VDH data)**







← Private Wells (1) ☰

PRIVATE WELL - Click for more Info > ...

[PRIVATE WELL REPORT](#)

WELL TAG: 14874  
WELL REPORT NUMBER (WRN): 14874  
WELL DEPTH (FT): 465  
YIELD (GPM): 2

*Not all drilled wells may be represented on this map. Wells drilled prior to 1966 and water supplies that are not drilled wells are not represented here. Additionally some wells drilled after this date may not have been reported. All well locations should be ground verified.*

Displaying 1 - 1 (Total: 1)

◀◀ Page 1 of 1 ▶▶

🏠 Natural Resou.. 🗨 Layers 🔍 Private Wells ...

Date Well Was Completed: 11-03-2000

Date Report Received: 01-24-2001

Well Driller License Number: 121 = Phillip Aylward , Valley

Well Report Number: 14874

Well Number/Tag Number: 14874

Comments:

Town: Manchester

Map Cell:

Tax Map:

E-911 Address: 326 West Fields

Sub Division:

Lot Number:

Owner's First Name:

Owner's Last Name: Red Mountain Construction

Purchaser's First Name:

Purchaser's Last Name:

Well Use Code: 01 = Domestic

Reason for Well Code: 1 = New Supply

Drilling Equipment Code:

Total Depth of Well (in feet): 465.00

Yield (in GPM): 2.00




☒ Geology

☐  Bedrock Outcrops (points)

☐  USGS Mineral Resources Data


System


☐  USGS Stream Gages

☐  Sand and Gravel Deposits

☐  Vermont Agricultural Onsite Mitigation 2016


☐  Quarry


☐  Surficial Geology (Linear Features)


☐  Soils - DEC On Site Sewage

Disposal Ratings

☐  Soils - Hydric


☐  Soils - Hydrologic Groups

☐  Soils - Floodable Soils

☐  Soils - Prime Agricultural

☐  Soils

☐  Bedrock Faults and Contacts

☐  Bedrock Outcrops (polygon)

☒ Bedrock Geology



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Search...

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Aerial wit...





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☒ Geology

☐  Bedrock Outcrops (points)


☐  USGS Mineral Resources Data System

☐  USGS Stream Gages

☐  Sand and Gravel Deposits

☐  Vermont Agricultural Onsite Mitigation 2016

☐  Quarry

☒  Surficial Geology (Linear Features)


☐  Quarry

☒  Surficial Geology (Linear Features)

☒  Surficial Geology (Feature Type)

☒  Surficial Geology (Lithology)

☐  Nitrate Leaching Index

☐  Soils - DEC On Site Sewage Disposal Ratings





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